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EXAMINER

KANG, INSUN

ART UNIT

PAPER NUMBER

2193

DATE MAILED: 11/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.



### **DETAILED ACTION**

1. This action is in response to the amendment filed 9/9/2005.
2. As per applicant's request, claims 1 and 9-17 have been amended. Claims 1-24 are pending in the application.

### ***Drawings***

3. Drawings filed 9/9/2005 have been acknowledged.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-24 are rejected under 35 U.S.C. 102(e) as being anticipated by Ogasawara (US Patent 6,671,877).

Per claim 1:

Ogasawara discloses:

- storing native code associated with a first method within a native code space  
("JITed codes are managed in memory," col 1 lines 50-57; "generates and stores

into a storage a code for recording a method call which is actually issued,” col 3 lines 10-45);

- creating a symbolic reference to the first method in a method table (“when compiling a method, a compiler creates a table of all target addresses...and affix it to a compile code...an entry ...associated with an effective call set of a method called is updated,” col. 5 lines 39-60; col. 6 lines 40-63)
- determining whether the native code space exceeds a threshold in response to an invocation of a second method (“if a memory request of a JIT compiler cannot be met in a certain thread,” col 4 lines 8-21; col 1 lines 50-60; “utilizing ...execution time information a degree of how readily a nonactive method is called (an activity degree),” col 3 lines 52-65)
- unwinding a stack to determine which methods are active (i.e. “in each thread, a frame of a JITed code is retrieved from a ceiling to a bottom of a stack (col. 6 lines 13-20)”
- reclaiming the native code (“A JITed code discarding policy is “to discard JITed codes that are not expected to be used immediately.” It can be expected that a method of a low activity degree will not be called for a while. If [J]ITed codes of methods not called for awhile are discarded, the amount of free memory used by them should be available for a long time,” col 4 lines 45-60) associated with the first method and compiling byte code into native code associated with the second method in response to determining that the second method is active(“an activity

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degree is allocated to all the methods, A JIT compiler discards JITed codes whose activities are lower...and continues compilation," col 6 lines 64-67)

- updating the method table for the first method to reference an appropriate symbolic reference ("when compiling a method, a compiler creates a table of all target addresses...and affix it to a compile code...an entry ...associated with an effective call set of a method called is updated," col. 5 lines 39-60; col. 6 lines 40-63)

as claimed.

Per claim 2:

The rejection of claim 1 is incorporated, and further, Ogasawara discloses:

-reclaiming the native code associated with the first method in response to a determination that the native code space exceeds the threshold ("if a memory request of a JIT compiler cannot be met in a certain thread...based on such an activity degree, some or all of JITed codes of a nonactive method are discarded," col 4 lines 8-21; col 1 lines 50-60)

as claimed.

Per claim 3:

The rejection of claim 2 is incorporated, and further, Ogasawara discloses:

-storing the native code associated with the second method within the native code space in response to the compilation("a second method which has a high possibility that

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the second method is actually called from a first method corresponding to a stack frame is specified and stored into a storage by using the calling map and information concerning method calls which are actually issued for the first method," col 3 lines 23-45)

as claimed.

Per claim 4:

The rejection of claim 2 is incorporated, and further, Ogasawara discloses:

-invoking the first method following the reclamation and re-compiling ...in response to the invocation of the first method ("A JIT compiler discards JITed codes whose activities are lower, restarts thread execution, and continues compilation," col 6 lines 64-67; "discarding a code to be effectively selected, frequency of recompile of an identical method could successfully be lowered and compile overhead reduce," col 7 lines 45-50; abstract) as claimed.

Per claim 5:

The rejection of claim 2 is incorporated, and further, Ogasawara discloses:

- compiling byte code into native code associated with the second method (col 4 lines 56-58; col 7 line 20) as claimed.

Per claim 6:

The rejection of claim 5 is incorporated, and further, Ogasawara discloses:

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-compiling byte code into native code associated with the second method ("compilation by a JIT compiler," col 4 lines 56-58)  
as claimed.

Per claim 7:

The rejection of claim 2 is incorporated, and further, Ogasawara discloses:

-determining whether the first method is active or inactive ("calculating an active degree of a method...is used to decide an activity degree of each method," col 4 lines 8-21; "A JITed code discarding policy is "to discard JITed codes that are not expected to be used immediately." It can be expected that a method of a low activity degree will not be called for a while," col 4 lines 45-53)

-reclaiming the native code associated with the first method in response to a determination that the first method is inactive (...based on such an activity degree, some or all of JITed codes of a nonactive method are discarded," col 4 lines 8-21)  
as claimed.

Per claim 8:

The rejection of claim 7 is incorporated, and further, Ogasawara discloses:

-determining whether the first method is hot or cold in response to a determination that the first method is inactive("calculating an active degree of a method...is used to decide an activity degree of each method," col 4 lines 8-21; "A JITed code discarding policy is "to discard JITed codes that are not expected to be used immediately." It can be

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expected that a method of a low activity degree will not be called for a while," col 4 lines 45-53)

-reclaiming the native code associated with the first method in response to a determination that the first method is inactive comprises reclaiming the native code associated with the first method in response to a determination that the first method is cold(...based on such an activity degree, some or all of JITed codes of a nonactive method are discarded," col 4 lines 8-21)  
as claimed.

Per claims 9-16, they are the machine-readable medium versions of claims 1-8, respectively, and are rejected for the same reasons set forth in connection with the rejection of claims 1-8 above.

Per claims 17-24, they are the data processing system versions of claims 1-8, respectively, and are rejected for the same reasons set forth in connection with the rejection of claims 1-8 above.

### ***Response to Amendment***

6. The amendment to the claims filed on 9/9/2005 does not comply with the requirements of 37 CFR 1.121(c) because:

Per claim 17, the claim has been amended but the identifier, "previously presented" is used. The correct identifier, "Currently amended" should be used.

Clarification/correction is requested. Also, the applicant is silent regarding the non-responsiveness on amendment filed 4/21/2005. Clarification is still requested. To



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expedite the prosecution, the examiner preceded further examination based on the claim limitations.

### ***Response to Arguments***

7. Applicant's arguments filed 9/9/2005 have been fully considered but they are not persuasive.

Per claim 1:

The applicant states, "Ogasawara does not teach or reasonably suggest unwinding a stack to determine which methods are active...in response to determining that the second method is active."

In response, Ogasawara clearly states that if "a memory limit is reached during compilation...the JIT compiler temporarily stops threads in operation...in each thread, a frame of a JITed code is retrieved from a ceiling to a bottom of a stack (col. 6 lines 13-20)." After the threads are stopped, the thread stack is unwound to detect active methods and to calculate an activity degree of methods. Therefore, Ogasawara discloses the limitations in claim 1 and accordingly, the rejection of claim 1 is considered proper and maintained.

Per claims 9 and 17:

The applicant states that Ogasawara does not disclose the limitations of claims 9 and 17, for the reasons set forth in connection with claim 1. As shown above, the rejection

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of claim 1 by Ogasawara is maintained, and accordingly, the rejections of claims 9 and 17 are also maintained.

Per claims 2-8, 10-16, and 18-24:

The applicant states that claims 2-8, 10-16, and 18-24 are allowable as being dependent on the allowable base claims. As has been shown above, the rejection of the independent claims by Ogasawara is proper, the argument that claims 2-8, 10-16, and 18-24 are allowable as being dependent on the allowable base claims is considered moot. Accordingly, the rejections of claims 2-8, 10-16, and 18-24 are considered proper.

### ***Conclusion***

**8. THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Insun Kang whose telephone number is 571-272-3724.

The examiner can normally be reached on M-F 7:30-4 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kakali Chaki can be reached on 571-272-3719. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry of a general nature or relating to the status of this application should be directed to the TC 2100 Group receptionist: 571-272-2100.

I. Kang  
Examiner  
11/18//2005

*IK*

  
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